Title:

Charles An; 2022; NFL Injury and Penalty Analysis; David Dobkin

Motivation and Goal:

Recent rule changes by the NFL have been passed in order to protect players and keep them safe. The goal of my project is to analyze whether or not player safety has been improved by the rule changes. This problem is important because it will provide insight into the sustainability and longevity of the league. If player safety continues to trend in the wrong direction, it will definitely affect football viewership and participation at all levels.

Problem Background and Related Work:

There is not any public research on player injury and rule changes. The NFL posts injury numbers every season and use them to justify the success of the rule changes, however, there is no proof or analysis on whether or not the root cause of the “decline” in injuries is caused by the rule changes and not external factors. Because of the lack of literature, the problem unsolved is very broad and will allow me to explore a lot of avenues.

Approach:

My approach is to use machine learning and data science techniques to determine the exact relationship between player injuries and rule changes and determine which factors actually affect the player injury numbers.

Plan:

I will first find play-by-play game data and aggregate penalties based on the penalty type. Then I will compare this data to player injury data by the NFL. I will make a list of possible factors contributing to player injuries and I will run correlation calculations between the factors to determine which one has the highest effect on player injury. I will also run autocorrelation calculations to determine whether or not we can predict injuries based on past rule change data. I will also compare penalty data to itself to determine if rule changes have any effect at all. If the total penalties don’t go up, then it is possible that we are just replacing one penalty with another and this is not going to have an effect on player safety. If this plan does not work out or does not produce any insightful analysis, then I will shift towards fantasy football and try to predict player performance week to week. If possible, then it would show that past performance can be used to predict future performance and this would be an incredibly useful tool to anyone playing fantasy football.

Evaluation:

I will evaluate my work based on how much insightful data I can retrieve. A lot of my idea is open-ended and doesn’t have a clear direction. If I can prove in some way that the expected result of rule changes (which would increase safety) is actually not true, then I would consider my project a success.